

## Claims

What is claimed is:

1. A demodulator comprising:

an input arrangement which accepts an input signal;

5        an active balun circuit which amplifies the input signal and converts the input signal to differential form;

at least one mixer;

said active balun circuit being adapted to drive said at least one mixer;

said active balun circuit comprising a negative shunt feedback arrangement.

10        2. The demodulator according to Claim 1, wherein said negative shunt feedback arrangement is adapted to apply variable gain in said at least one mixer.

3. The demodulator according to Claim 1, wherein said negative shunt feedback arrangement is adapted to provide stabilized input impedance.

15        4. The demodulator according to Claim 1, wherein said at least one mixer comprises two mixers, said two mixers being adapted to provide differential outputs.

5. The demodulator according to Claim 1, wherein said negative shunt feedback arrangement comprises a resistor and a capacitor in series.

6. The demodulator according to Claim 1, wherein said active balun circuit further comprises:

5 a transistor;

wherein said negative shunt feedback arrangement connects between the collector and base of said transistor.

7. The demodulator according to Claim 1, wherein said active balun circuit further comprises:

10 an inverting output;

wherein said negative shunt feedback arrangement interconnects said input arrangement with said inverting output.

8. The demodulator according to Claim 7, wherein said active balun circuit further comprises:

15 a transistor;

wherein said negative shunt feedback arrangement connects between the collector and base of said transistor in interconnecting said input arrangement with said inverting output.

9. The demodulator according to Claim 7, wherein said active balun circuit  
5 further comprises:

a non-inverting output; and

a compensating arrangement adapted to ensure approximately equal loading on said inverting and non-inverting outputs.

10. The demodulator according to Claim 9, wherein said compensating  
10 arrangement comprises an additional resistor and an additional capacitor in series, said additional resistor and additional capacitor in series being connected between said non-inverting input and ground.

11. The demodulator according to Claim 7, wherein said active balun circuit further comprises:

15 a non-inverting output;

said negative shunt feedback arrangement being adapted to reduce the amplitude of said inverting output more than a reduction in the amplitude of said non-inverting output.

12. The demodulator according to Claim 1, wherein said active balun circuit  
5 further comprises:

an inverting output;

a non-inverting output; and

a first load tuning arrangement connected between said inverting output and  
power supply voltage; and

10 a second load tuning arrangement connected between said non-inverting output  
and power supply voltage.

13. The demodulator according to Claim 1, wherein said active balun circuit  
further comprises:

an inverting output;

15 a non-inverting output; and

a first load tuning arrangement connected between said inverting output and power supply voltage; and

a second load tuning arrangement connected between said non-inverting output and ground.

5        14. The demodulator according to Claim 1, whereby overall distortion is reduced via said negative shunt feedback arrangement.

15. The demodulator according to Claim 1, wherein said demodulator is adapted for incorporation into a radio-frequency front end of a cellular telephone handset.